

**DIRECTORATE OF STEAM BOILERS**

**(MAHARASHTRA STATE)**

**EXAMINATION FOR CERTIFICATE OF PROFICIENCY AS A  
BOILER OPERATION ENGINEER**

**(Under the Boiler Operation Rules, 2021)**

**Engineering Drawing**

**9th March 2025**

**(TIME : 10-00 A.M. TO 1-00 P.M.)**

**(Max. Marks—100)**

---

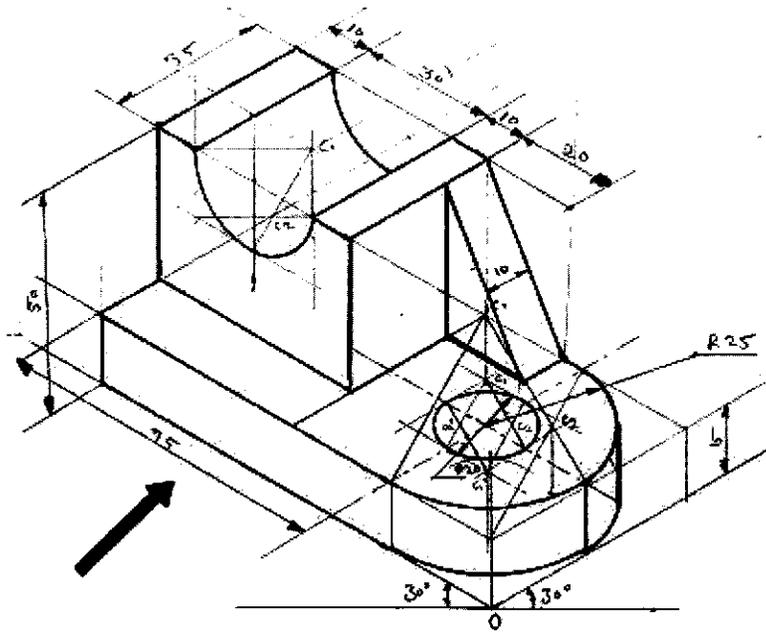
**Instructions to Candidates :—**

- (1) Attempt any **five** questions.
  - (2) All questions carry **equal** marks.
  - (3) Figures to the right indicate **full** marks.
  - (4) Use suitable **Scale** where required.
  - (5) Assume suitably **missing data**, if any.
- 

|   | <b>Marks</b> |
|---|--------------|
| 1. (a) Draw a schematic sketch of float type steam trap.    | 5            |
| (b) Draw symbols of the following :—                        | 5            |
| (i) Orifice   |              |
| (ii) Globe Valve Hand Operated                              |              |
| (iii) Control Valve   |              |
| (iv) Safety Valve   |              |
| (v) Non return Valve.                                       |              |
| (c) Draw free hand proportionate sketch of the following :— | 10           |
| (i) Short radius elbow                                      |              |
| (ii) Eccentric reducer                                      |              |
| (iii) Hanging support                                       |              |
| (iv) Boiler tube to tube butt weld edge preparation         |              |
| (v) Pipe strainer for pipeline.                             |              |

2. Following figure shows a pictorial view of an object. Draw front view and top view of the object showing all dimensions :—

(The arrow indicates the direction from which to obtained front view)



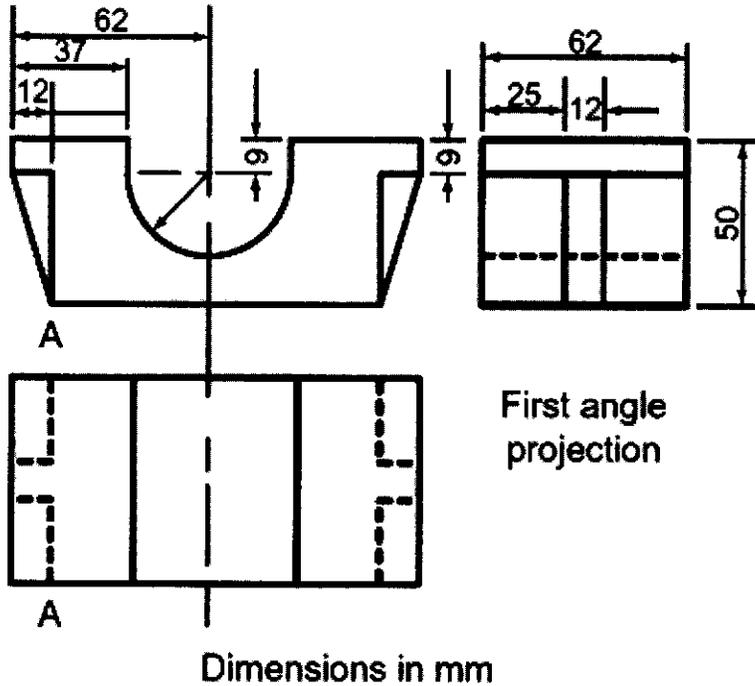
3. (a) Draw a schematic freehand sketch of the Boiler feed water pump components. 10
- (i) Impeller
  - (ii) Casing Ring
  - (iii) Split Ring
  - (iv) Balancing Disc
  - (v) Balancing Disc wear seat.

**OR**

Draw the detailed diagram of agro waste fired, three pass, fully wet back smoke tube boiler.

- (b) Draw a detailed diagram showing the Boiler tube expansion within the drum. 5
- (c) Draw a 200 mm NB steam distribution header with five different size branches. 5

4. Three views of a bearing are shown in the following figure. Make an isometric drawing of bearing. Corner "A" should be the lowest point in your drawing. 20



5. (a) Draw proportionate sketch of the following (any *two*) :— 10
- (i) Mobray dual controls.
  - (ii) Fusible plug.
  - (iii) Reflex type water level gauge.
- (b) Draw "U" tube of water tube boiler with following dimensions. 10  
 Tube size 76.2 mm OD X 5mm thick, radius 75 mm, leg length 300 mm, also mention developed length and heating surface of the tube.
6. (a) Draw a rankine cycle for supercritical power plant. 5
- (b) Draw a proportionate schematic general arrangement of a deaerator, labeling all key components and including arrows for flow paths. 5
- (c) Based on your experience, choose one of the following and draw the corresponding drawing :— 10
- (i) General arrangement drawing of a coal-fired boiler system designed to handle a 500 MW load. Include fuel handling, flue gas path, water path, steam path and auxiliary systems.
  - (ii) General arrangement drawing of a bagasse-fired boiler system used in a sugar mill. Include fuel handling, flue gas path, water path, steam path and auxiliary systems.